

I claim:

1. A radio frequency management system for reallocation of radio spectrum among a plurality of wireless communication networks using differing transmission protocols and/or differing radio frequencies to communicate with a plurality of frequency and protocol agile portable radio devices each of which is responsive to portable radio device control signals to change its operating frequency and transmission protocol, comprising

10 capacity detection means for generating a frequency request signal upon determining that a wireless communication network is at or near full capacity,

15 frequency reallocating means responsive to a frequency request signal to reassign temporarily radio spectrum from a wireless communication network utilizing less of its normally assigned radio frequency to the communication network determined by said capacity detection means to be at or near full capacity, and

means for causing portable radio control signals in at least some of the frequency and protocol agile portable radio devices to change their operating frequency and transmission protocol to permit the portable radio devices so changed to communicate over the temporarily reassigned radio spectrum.

20 2. A radio frequency management system as defined in claim 1, further including a plurality of frequency and protocol agile portable radio devices each of which includes

25 a frequency agile radio transceiver adapted to operate at a radio frequency appropriate for each of the plurality of wireless communication networks as determined by a frequency control signal,

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a digital interface circuit for interconnecting said frequency agile radio transceiver with external devices to allow information to be sent and received over said frequency agile radio transceiver,

5 protocol agile operating circuit means for operating said frequency agile radio transceiver and said digital interface circuit in accordance with one of the transmission protocols as determined by a protocol control signal, and

10 adaptive control means for accessing a selected wireless communication network and for generating the frequency control signal and the protocol control signal in response to a user defined criteria to cause the device to communicate with the selected wireless communication network using the frequency determined by the frequency control signal and the protocol determined by the protocol control signal.

15 3. The radio frequency management system defined in claim 2, wherein said adaptive control means selects the wireless communication network based on the least cost.

20 4. The radio frequency management as defined in claim 2, wherein said adaptive control means selects the wireless communication network based on the quality of the radio transmission link connecting said frequency agile transceiver and the selected wireless communication network.

5. The radio frequency management as defined in claim 2, wherein said adaptive control means selects the wireless communication network based on the probability of being dropped from the network.

6. The radio frequency management as defined in claim 2, wherein said adaptive control means selects the wireless communication network based on the security of the radio transmission link connecting said frequency agile transceiver and the selected wireless communication network.
- 5 7. The radio frequency management as defined in claim 2, wherein said adaptive control means selects the wireless communication network based on prior experience with specific wireless communication networks.
- 10 8. The radio frequency management as defined in claim 2, wherein said adaptive control means selects the wireless communication network based on the combined determination of two or more of the following:
 - the cost of using the wireless communication network,
 - the quality of the transmission link connecting said frequency agile transceiver and the selected wireless communication network,
 - prior experience with specific wireless communication networks,
 - 15 the potential of being dropped from the network, or
 - the security of the radio transmission link connecting said frequency agile transceiver and the selected wireless communication network.
- 20 9. The radio frequency management as defined in claim 2, wherein adaptive control means is adapted to communicate in accordance with an electronic handshake with selected wireless communication networks to determine on a real time basis the cost for desired services and operating characteristics of the corresponding wireless communication network.

10. The radio frequency management as defined in claim 2, further including a modem means for modulating and/or demodulating a carrier signal with user data.

5 11. The radio frequency management as defined in claim 10, further including a data processor means for processing digital data sent and/or received over said frequency agile transceiver.

10 12. The radio frequency management as defined in claim 11 for use with wireless communication networks having call placement and call answering functions, wherein said data processor means is adapted to cause said frequency agile transceiver to control telephone call placement and call answering functions over wireless communication networks having such telephone functions.

15 13. A method for reallocation of radio frequency spectrum among a plurality of wireless communication networks using differing transmission protocols and/or differing radio frequencies to communicate with a plurality of frequency and protocol agile portable radio devices each of which is responsive to portable radio device control signals to change its operating frequency and transmission protocol, comprising the steps of

20 generating a frequency request signal upon determining that a wireless communication network is at or near full capacity,

reassigning temporarily in response to a frequency request signal radio spectrum from a wireless communication network utilizing less of its normally assigned radio frequency to the communication network determined to be at or near full capacity, and

causing portable radio control signals in at least some of the frequency and protocol agile portable radio devices to change their operating frequency and transmission protocol to permit the portable radio devices so changed to communicate over the temporarily reassigned radio spectrum.

5 14. A method as defined in claim 13, comprising the further steps of

operating a frequency agile radio transceiver at a radio frequency appropriate for one of the plurality of wireless communication networks as determined by a frequency control signal,

10 interconnecting said frequency agile radio transceiver with external devices to allow information to be sent and received over said frequency agile radio transceiver,

operating said frequency agile radio transceiver in accordance with one of the transmission protocols as determined by a protocol control signal, and

15 accessing a selected wireless communication network by generating the frequency control signal and the protocol control signal in response to a user defined criteria to cause the device to communicate with the selected wireless communication network using the frequency determined by the frequency control signal and the protocol determined by the protocol control signal.

20 15. The method as defined in claim 14, wherein said step of selecting the wireless communication network is based on the least cost.

16. The method as defined in claim 14, wherein said step of selecting the wireless communication network is based on the quality of the radio

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transmission link connecting said frequency agile transceiver and the selected wireless communication network.

17. The method as defined in claim 14, wherein said step of selecting the wireless communication network is based on the probability of being dropped from the network.
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18. The method as defined in claim 14, wherein said step of selecting the wireless communication network is based on the security of the radio transmission link connecting said frequency agile transceiver and the selected wireless communication network.

10 19. The method as defined in claim 14, wherein said step of selecting the wireless communication network is based on prior experience with specific wireless communication networks.

15 20. The method as defined in claim 14, wherein said step of selecting the wireless communication network is based on the combined determination of two or more of the following:

the cost of using the wireless communication network,

the quality of the transmission link connecting said frequency agile transceiver and the selected wireless communication network,

prior experience with specific wireless communication networks,

20 the probability of being dropped from the network, or

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the security of the radio transmission link connecting said frequency agile transceiver and the selected wireless communication network.

21. The method as defined in claim 14, further including the step of engaging in an electronic handshake with selected wireless communication networks to determine on a real time basis the cost for desired services and the operating characteristics of the corresponding wireless communication network.
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22. The method as defined in claim 14, further including the step of causing said frequency agile transceiver to control telephone call placement and call answering functions over wireless communication networks having such telephone functions.
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